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Using stealth marketing techniques to increase physical activity and decrease sedentary time in the workplace: a feasibility study investigating the spill-overs of employee pro-environmental behaviour

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Abstract

Sedentary lifestyles have adverse effects on health and wellbeing and are especially prevalent amongst office-based employees. This project goes above and beyond currently existing physical activity initiatives in the workplace, by examining the feasibility of using a "Bait-and-Tease" stealth marketing intervention promoting increased physical activity and reduction of sedentary behaviour in the workplace amongst office-based employees. The intervention focused on promoting employee pro-environmental behaviour in the workplace (i.e., energy saving and recycling). This was the "Bait" part of the technique, which made no reference to physical activity. The spillovers of employee pro-environmental behaviour change on employee physical activity and sedentary behaviour were then evaluated. This was followed by a reveal stage, the "Tease" part of the technique, where the link between

health and the environment was made explicit (e.g., taking the stairs instead of the elevator saves energy while also increasing walking time) and participants were informed of the true purpose of the intervention. Initial employee focus groups, grounded on the Behaviour Change Wheel framework, fed into an intervention co-development workshop. The developed intervention, which included an informational campaign and a green champion, was piloted within a Higher Education Institution and targeted academics, professional service members, and postgraduate research students as university employees with office-based jobs. The pilot involved an intervention and a control-group, with a "before" and "after" research design. Both self-reported (i.e., employee surveys measuring pro-environmental behaviour) and observational (i.e., tracking walking and standing time via a mobile application, recording sedentary time and counting stairs via trained observers) data were collected. Results indicate that the intervention was found feasible and the pilot study shows potential for large-scale implementation, even though the pilot sample size was small. The goals of the study were achieved and problems in relation to recruitment, adherence and measurements were identified with multiple future research directions.

Keywords: stealth marketing intervention; employee physical activity, employee pro-environmental behaviour; spillovers; feasibility; pilot study

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1. INTRODUCTION

There is a growing body of literature on physical activity interventions in the workplace (Gardner et al., 2017; Mansfield et al., 2018; Procter et al., 2014; Smith et al., 2015), as office workers spend most of their working day sitting (Buckley et al., 2015) (i.e., 5.3 hours in the U.K.; Gardner et al., 2016). Emerging research suggests that even light physical activity, including standing and slow walking, and thus a reduction of sedentary time (Caspersen et al., 1985), "may aid in the prevention of major non-communicable disease risk factors" (Smith et al., 2015). This is why "the workplace offers ... an arena to promote physical activity and reduce sedentary time" (Smith et al., 2016, pp.185]. However, research on workplace physical activity interventions, aiming to increase physical activity and reduce sedentary behaviour at the individual employee level, reports mixed findings in regard to their effectiveness, ranging from small effects to no significant effect (Smith et al., 2016). Most of these studies focus on individual models or theories of behaviour change to inform intervention designs, based on the principle that attitudes and beliefs lead to behaviour change (Smith et al., 2016).

However, knowledge does not always translate into changes in behaviour (Manika et al., 2019). Consequently, aside from educational behaviour change interventions (e.g. Workplace Challenge; Adams et al., 2018), research has also examined environmental modification interventions (e.g. Active Buildings; Smith et al., 2013), and various intrapersonal, interpersonal and political level factors that may lead to behaviour change within this context (Smith et al., 2016). This project attempts to overcome issues faced by existing physical activity initiatives in the workplace, by using a novel, "stealth marketing" approach and addressing calls for further research on physical activity and sedentary behaviour in the workplace (Smith et al., 2016). Physical activity is defined, in this paper, as any bodily movement resulting in energy expenditure including walking (Caspersen et al., 1985; Pillay et al., 2015; NHS Choices, 2017) and standing (Healy et al., 2008; Dunstan et al., 2012; Smith et al., 2013).

Using undercover ways of promoting a behaviour, stealth marketing cuts through the clutter, as the target audience is largely unaware of the true intent of a recommendation and hence it catches people when they are most open to word-of-mouth (Kaikati and Kaikati, 2004). Stealth interventions are capable of changing behaviour towards a healthier lifestyle by motivating people to perceive behaviour not as a burden, but as fun and rewarding. Given the evidence of stealth approaches in stimulating physical activities, the research community has flagged the need to widely engage marketing and media in promoting a healthy environment (Evans and Hastings, 2008). The focus on motivational factors could make stealth marketing a primary tool in promoting a healthy environment, against the backdrop of other behavioural interventions that have not brought sustained results so far (Summerbell et al., 2005; Summerbell et al., 2005; Harris et al., 2009).

In line with a social/ideological movement type of stealth marketing approach (Robinson, 2010) and given the increasing public concern over the environment which has resulted in an increasing interest in environmental sustainability corporate social responsibility initiatives (Manika et al., 2015), the current study focused on employee pro-environmental behaviour in the workplace and its link with health and well-being. 'Employee pro-environmental behaviour' refers to employees' measurable actions linked to environmental sustainability (Ones and Dilchert, 2012), which are intentional and fully under the control of employees (Mesmer-Magnus et al., 2012; Yang et al., 2018). Workplace pro-environmental behaviours such as energy saving have been previously linked to health behaviour and well-being (van Houten et al., 1981; Manika et al., 2017), indicating the potential spillovers of pro-environmental behaviour change (Nilsson et al., 2017; Dolan and Galizzi, 2014; Steinhorst and Matthies, 2016) on physical activity.

The authors developed a "Bait-and-Tease" stealth marketing intervention (Roy and Chattopadhyay, 2010), promoting increased physical activity and a reduction in sedentary behaviour in the workplace amongst office-based employees, via advocating energy saving and recycling and examined the spillovers of those behaviours. This intervention formed the "Bait" part of the technique, which made no reference to physical activity. The intervention was developed based on input from employee focus groups, which then fed into an intervention co-development workshop. The resulting intervention, which included an informational campaign and a "green champion", was tested within a Higher Education Organisation and targeted academics, professional service members and postgraduate research students as university employees with office-based jobs. The intervention involved an intervention and a control-group, with a before and after research design. The spillovers of employee pro-environmental behaviour change on employee physical activity and sedentary behaviour were then evaluated. Both self-reported (i.e., employee surveys measuring pro-environmental behaviour) and observational (i.e., tracking walking and standing time via a mobile application, recording sedentary time and counting stairs via trained observers) data were collected. Later followed a reveal stage, the

"Tease" part of the technique, where the link between health and the environment was made explicit (e.g., taking the stairs instead of the elevator saves energy while also increasing walking time) and participants were informed of the true purpose of the intervention.

Overall, this project examined the feasibility of using a Bait-and-Tease stealth marketing intervention, grounded on employee energy saving and recycling behaviour, as a means of increasing office-based employees' physical activity and reducing sedentary time in the workplace. After pertinent literature is discussed on stealth marketing and the link between physical activity and pro-environmental behaviour, followed by an overview of the theoretical framework (i.e., the Behaviour Change Wheel) guiding our work, a series of research questions and hypotheses are developed. Then the various stages of the feasibility study are described in detail, followed by the results within each stage. This paper finally discusses the results across all stages, and identifies the limitations of our work and future research directions.

2. PERTINENT LITERATURE

2.1. Stealth marketing: linking physical activity and pro-environmentalbehaviour

Roy and Chattopadhyay (2010) note that stealth marketing as a strategy can be used "…to do good for society, and at times to generate positive publicity". Along with the fact that knowledge does not always translate into behaviour change, this underscores the increasing interest in stealth marketing interventions promoting physical activity (Riekert et al., 2014). Stealth interventions are capable of changing behaviour towards a healthier lifestyle by motivating people to perceive behaviour not as a burden, but as fun and rewarding. Stealth tactics have been used for obesity prevention and health improvement through physical exercises (Cibrian, 2016; Flores, 1995). The motivation to engage in physical activities can be achieved by deemphasizing the appeal to logic and the extrinsic benefits of behaviour change (Harris et al., 2009; Robinson, 2010; Roblin, 2007). The main reason that may underpin the success of stealth interventions in promoting physical activity is an individual's self-efficacy. Delayed benefits of the activity focused on extrinsic outcomes, such as weight loss, can decrease self-efficacy, thus causing psychological discomfort as a result of unmet expectations and high effort (Festinger, 1957; Robinson, 2010). To improve self-perception, people are more likely to derogate the behaviour, thus bringing low incremental outcomes and causing psychological discomfort (Festinger, 1957). For example, obesity among children can be prevented by redefining extracurricular physical activities as fun, social and artistic activity, rather than a source of fatigue. Weight loss, physical fitness, reduction in the risk of chronic diseases become the side effect of the physical activities rather than the primary goal, while the process itself becomes the primary motivational factor (Robinson, 2010).

The success of stealth tactics was confirmed by the "Dance for Health" initiative. This was aimed at comparing the effect of dances versus traditional physical classes on weight loss and overall children's fitness. While the effect of the alternative approach was positive and significant for girls, the experiment did not produce similar results for the boys' group (Flores, 1995). Nonetheless, the overall contribution of stealth interventions in the promotion of physical fitness was evident. Another successful programme is Hunting Relics, which incorporated the elements of game and collaboration in physical exercises in schools. The pre- and post-evaluation of children's engagement shows a significant difference in behaviour (Cibrian, 2016). Given the evidence of stealth approaches in stimulating physical activities, the research community has flagged the need to widely engage marketing and media in promoting a healthy environment (Evans and Hastings, 2008). However, to date, stealth marketing approaches have largely been used by industries to benefit from individuals' health illiteracy (Harris et al., 2009; Roblin, 2007). Due to the ability of stealth marketing to tackle the psychological and sociological underpinnings of behaviour, food producers use symbolic messages in marketing to associate products with users' self-identity (Schor and Ford, 2007). Similarly, stealth marketing can be used for promoting the hedonic benefits of physical practices and a healthy lifestyle. In addition, portraying something symbolically may create the perception of activity as more socially favourable, thus affecting the attitude and subsequent behavioural intention. The focus on motivational factors can make stealth marketing a primary tool in promoting a healthy environment, against the backdrop of other behavioural interventions that have not brought sustained results so far (Harris et al., 2009; Summerbell et al., 2005, Summerbell et al., 2003,).

Robinson (2010) identified three types of stealth marketing approaches for motivating behaviour change in the health domain: 1) emphasizing incentives for the process of behaviour change rather than the desired outcome; 2) health-promoting environments/activities that are intrinsically motivating; and 3) participation in social/ideological movements as a motivator for behaviour change, e.g., environmental sustainability. In line with the third approach, given the increasing public concern over

the environment, the hazards that human behaviours may pose, and the increasing interest in environmental sustainability and corporate social responsibility initiatives (Manika et al., 2015), the current study focused on employee pro-environmental behaviour in the workplace and its link with health and well-being.

Pro-environmental behaviours are defined as any action that intentionally seeks to minimise negative behavioural impacts on the natural and built world (Yang et al., 2018). 'Employee pro-environmental behaviour' refers to employees' measurable actions linked to environmental sustainability (Ones and Dilchert, 2012), which are intentional and fully under the control of employees (Mesmer-Magnus et al., 2012; Yang et al., 2018). Increasingly, research on pro-environmental behaviour is focusing on the workplace specifically, distinct from such behaviour in a household context (Nye and Hargreaves, 2010; Smith and O'Sullivan, 2012; McDonald, 2014; Blok et al., 2015). While some similar factors are important to pro-environmental behaviour in both contexts, such as the intention to act (someone's attitude towards the behaviour, their subjective norms, and their behavioural control over the situation), in the workplace other factors come into play, like social norms and leadership support (Blok et al., 2015).

In the workplace, it is much more difficult to break out of old roles and practices and establish new ones, as behavioural changes rely for a large part on implicit social expectations (Nye and Hargreaves, 2010). Workplace pro-environmental behaviours such as energy saving (other pro-environmental behaviours include recycling, printing reduction and environmentally-friendly commuting; Manika et al., 2015) have been previously linked to increased physical activity [i.e., usage of stairs instead of a lift to save energy (van Houten et al., 1981)]. In a hospital intervention study encouraging employee energy saving behaviour, employees perceived better job planning due to closing doors or opening windows (which stabilises room temperatures without heating/cooling system energy usage) and improved concentration and less discomfort/headaches from lighting (due to switching off lights to save energy) (Manika et al., 2016). These findings indicate the potential spillovers of pro-environmental behaviour change on health and well-being (Nilsson et al., 2016; Dolan and Galizzi, 2014; Steinhorst and Matthies, 2016) including physical activity (although the van Houten et al., 1981 study focused on an environmental modification intervention rather than a stealth marketing approach promoting employee pro-environmental behaviour change). Guided by these findings and the 'Behaviour Change Wheel' (Michie et al., 2011), this study examined the feasibility of and piloted a Bait-and-Tease stealth marketing intervention, promoting increased physical activity and reduction in sedentary behaviour in the workplace amongst office-based employees, via advocating employee pro-environmental behaviour (i.e., energy saving and recycling) and examining its spillovers.

2.2. The Behaviour Change Wheel framework

The stealth marketing intervention design, which focused on employee-pro-environmental behaviour change as a way to motivate increased physical activity and reduction in sedentary time, was guided by the Behaviour Change Wheel (BCW, Michie et al., 2011) originally conceptualised within a health context. This framework consists of three layers: 1) sources of behaviour, 2) intervention functions and 3) policy categories. The sources of behaviour form the core of the BCW, which is called the 'COM-B system': Capability, Opportunity and Motivation interact to generate behaviour, which in turn can influence each of these components. The COM-B system includes Capability, both physical and psychological (i.e. the capability to engage in the required cognitive processes); physical and social Opportunity (i.e., reflecting environmental or contextual rather than individual attributes such as opportunities/barriers of the physical environment and cultural norms/values, respectively); and reflective and automatic Motivation (i.e., conscious reasoning and decision making and habitual and emotional responses, respectively).

The next level of the BCW consists of nine behaviour change intervention functions (i.e. education, persuasion, incentivisation, coercion, training, restriction, environmental restructuring, modelling, enablement), each addressing a subset of the sources of behaviour. Specifically, physical training and enabling interventions (e.g. surgery, medication) help achieve physical capability, whereas training cognitive/emotional/behavioural skills, increasing knowledge and adopting enablers contribute to the development of psychological capability. Developing knowledge and understanding emotions about the behavioural target through education and training improve reflective motivation. In contrast, automatic motivation is the result of associative and imitative learning, impulses about behavioural targets, habit formation and the direct effect of enablers, such as medication. Environmental change/restructuring creates both physical and social opportunity.

The final level of the BCW consists of seven policy categories enabling or supporting behaviour change interventions: communication/marketing, guidelines, fiscal policy, regulation, legislation,

environment/social planning and service provision. For example, marketing and communication policies facilitate education, persuasion, incentivisation, coercion and modelling interventions. Guidelines, regulation and legislation address all but modelling interventions. Fiscal policy mostly promotes incentivisation, coercion, training, environmental restructuring and enablement. Environmental/social planning supports environmental restructuring and enabling interventions, whereas service provision facilitates all interventions except for restriction and environmental restructuring (Michie et al., 2014; Michie et al., 2011).

In recent years, interventions based on the BCW, and the COM-B model specifically, have been proposed to increase physical activity or reduce sedentary time in for example people with a cardiovascular disease risk and mental health concerns (Howlett et al., 2017) and teenage girls (Murtagh et al., 2018). To encourage adolescent girls to walk more, Murtagh and colleagues recommended addressing six intervention functions (i.e. persuasion, education, incentivization, modelling, training, enablement) and eighteen behaviour change techniques, including planning, social support, feedback and monitoring. In a study by Cibrian and colleagues (2016), COM-B was used as a framework to design an exergame (the combination of exercises and games), aimed at promoting collective exercise among children. 'Active 10', a popular mobile app introduced by Public Health England (NHS, 2020), encourages app users to walk briskly for bouts of 10 or more minutes a day. An integrated marketing campaign, directing target users (particularly 40-60 year olds) towards the app, was structured around the COM-B model, targeting specific perceived barriers in the Motivation, Opportunity and Capability dimensions (Brannan et al., 2019).

For physical activity and sedentary time behaviour change initiatives in the workplace specifically, the literature is scarcer. In an intervention study aimed at reducing the sitting time of office-based National Health Service (NHS) employees, the COM-B model was used to guide focus groups to discuss barriers to and facilitators of the reduction in sitting at work (Munir et al., 2018). From the results the authors identified seven relevant intervention functions for their intervention, which was designed by integrating multiple BCW components. The most relevant intervention functions highlighted by this study were Enablement, Education and Training.

The use of behaviour change theories such as the BCW for developing interventions is relatively recent, and so far the availability of outcomes is limited. However, in a recent systematic review on interventions aiming to reduce sedentary behaviour, the authors retrospectively coded studies according to the intervention functions they used (Gardner et al., 2016). The review identified Education, Persuasion, Environmental Restructuring and Training as the most promising intervention functions so far. When looking at workplace interventions only, both Environmental Restructuring (often in the form of introducing standing workstations) and Education were deemed promising.

With regard to pro-environmental behaviour change initiatives based on the COM-B model, studies have focused, for example, on the barriers to and drivers of household water conservation initiatives (Addo, 2018) and recycling behaviours (Gainforth et al., 2016). In a recent systematic review of behaviour change interventions for saving energy in office-type workplaces, Environmental Restructuring (often overlapping with Education and Persuasion), Modelling and Enablement were identified as intervention functions with the largest potential for success, although some intervention functions had not been studied in any workplace environmental behaviour studies yet (Staddon et al., 2016). Overall, the use of the COM-B model within the pro-environmental behaviour change literature remains scarce. Our work fills this gap in the literature, given the aim of linking health and environmental behaviour within the workplace and utilising a stealth approach.

2.3. Research questions and hypothesis development

Based on the aforementioned literature and the focus on employee pro-environmental behaviour, the following research questions (RQs) were explored:

RQ1: To what extent do employees understand the importance, and what are the perceived benefits and motivations behind, pro-environmental behaviours in the workplace?

RQ2: What are the perceived opportunities of and barriers to engaging in pro-environmental behaviours in the workplace

RQ3: What physical and psychological capabilities are needed to perform pro-environmental behaviours in the workplace?

These research questions reflect the COM-B framework, and guide the development of our intervention (see details in the Stage 1 section of the paper).

In addition, after the development of our intervention, to examine the acceptability of using a stealth approach in promoting physical activity in the workplace, via advocating employee pro-environmental behaviours, we formulated the following research question:

RQ4: To what extent did employees perceive the stealth marketing intervention in promoting physical activity in the workplace, via advocating employee pro-environmental behaviours, to be acceptable and what were the intervention outcomes?

In order to examine RQ4, a series of hypotheses were formulated. Specifically, physical activity, based on prior literature, was examined in terms of walking time (Caspersen et al., 1985; Pillay et al., 2015; NHS Choices, 2017) and standing time (Healy et al., 2008; Dunstan et al., 2012; Smith et al., 2013). We also, used sedentary time and counting stairs as additional metrics. Given the stealth intervention aimed at promoting physical activity in the workplace, it was expected that there would be an increase in walking time, standing time, and stairs used after the intervention, and a decrease in sedentary time after the intervention. Given the focus on pro-environmental behaviour in the workplace, we also hypothesised effects related to recycling and energy saving behaviours, as additional intervention outcomes. In line with the intervention, it was expected that recycling behaviour and energy saving behaviour would increase after the intervention. Based on the use of a before and after, control versus intervention groups, research design, we hypothesised that:

H1: a) Recycling behaviour and b) energy saving behaviour amongst employees will increase after the stealth intervention for the intervention group, but will stay the same for the control group.

H2: a) Walking time, b) standing time, and c) use of stairs will increase after the stealth intervention for the intervention group, but will stay the same for the control group.

H3: Sedentary time will decrease after the stealth intervention for the intervention group, but will stay the same for the control group.

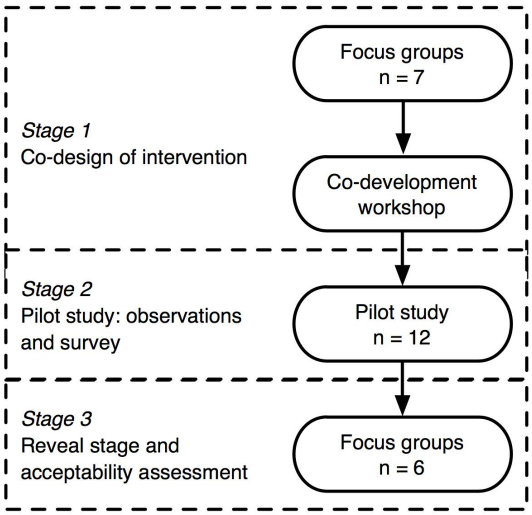
Given that perceptions may be inaccurate, this paper also benefits from measures of actual behaviour for physical activity metrics via observations and a mobile application. Only for pro-environmental behaviours are self-reported measures used. These hypotheses are examined in Stage 2 of our project via a pilot.

3. METHODOLOGY: AN OVERVIEW

Our feasibility assessment and pilot study took place within a Higher Education Institution and focused on academics, professional service members and postgraduate research students, as university employees with office-based jobs. Universities are large organisations with a diverse population of employees (Manika et al., 2019). This diversity was essential for our feasibility study, in order to examine the acceptability of a stealth marketing approach to multiple desk-based roles.

Figure 1 identifies the three stages of our feasibility study. Initial employee focus groups fed into an intervention co-development workshop (Stage 1 addressing RQ1 to RQ3). A pilot was then conducted (Stage 2 examining H1 to H3), which was followed by a reveal stage and acceptability of the approach assessment via focus groups (Stage 3). The later two stages address RQ4.

Figure 1. Project stages: overview



It should be noted that even though the sample sizes are small, this project benefited from an innovative approach to promoting physical activity in the workplace, while observational data were used, which required an extensive time commitment to track the physical activity of employees. The results here offer insights into the acceptability of the stealth approach. Ethics approval was attained for all stages prior to the beginning of this project (Ethics Approval Reference: QMREC2041a). Each stage of our project is described below in detail, including the methods and results within each stage.

4. STAGE 1: CO-DESIGN OF INTERVENTION

4.1. Focus groups: Methods

Two focus groups were held amongst university employees, in order to: 1) understand the importance, perceived benefits (including potential spillover co-benefits), and motivations behind pro-environmental behaviours (RQ1); 2) investigate the perceived opportunities and barriers to engaging in environmental behaviours in the workplace (RQ2); and 3) identify the physical and psychological capability to perform the required environmental behaviours in the workplace (RQ3).

Focus group participants were recruited via a combined purposive and convenience sampling technique. An email was sent to all academics, professional services members and postgraduate research students from three different Schools within the selected university asking them if they would like to participate in the focus groups. The Schools were chosen for their similarities in department layout (i.e., floors the offices were located on, location of lifts and stairs). In total, seven people participated (four and three participants, respectively). The groups comprised 3 academics and 4 professional services members, while all three Schools were represented. Participants were informed that the project was about "Workplace pro-environmental behaviours and lifestyle habits", implying a scope beyond environmental impact without explicitly referring to health. The focus group participants were asked what comes to mind when they hear the terms "workplace pro-environmental behaviour" and "lifestyle habits" to gauge their understanding of the terms prior to the main focus group questions. The focus groups were led by two moderators. They were transcribed verbatim and audio recorded. All participants gave written informed consent prior to the focus groups. At the end of the session, participants received a debriefing letter summarising the purpose of the study and inviting them to volunteer for the role of 'Green Champion' for the pilot intervention study (see section 3.3).

The COM-B model, as part of the Behaviour Change Wheel framework [34], was used for structuring the focus groups. See Table 1 for example questions. In addition to the COM-B components, participants were asked about their ideas on motivating employees to engage more in pro-environmental behaviour. The transcriptions were analysed using thematic coding, which allowed not only themes of the COM-B framework to emerge but the identification of related sub-themes.

Table 1. Focus group sample questions based on the COM-B framework

COM-B component	Focus Group Same Questions
Capabilities	What particular knowledge or capabilities do you have that help your pro-environmental behaviours at work? What particular knowledge or capabilities do you think you lack, impeding your pro-environmental behaviours at work?
Motivation	What are your motivations to be involved in pro-environmental activities at work? What are the benefits for you to have pro-environmental behaviours at work? What are the benefits for your team/department/organisation to have pro-environmental behaviours at work?
Opportunity	What facilities and procedures provided promote pro-environmental actions at work? What barriers do you encounter in your workplace in terms of pro- environmental behaviours?

4.2. Focus groups: Results

In regard to the awareness of the terms "workplace pro-environmental behaviours and lifestyle habits", participants referred to a wide range of pro-environmental behaviours at work that can be undertaken at the individual level, such as printing reduction, recycling, switching off lights/machines, activism, choice of transport mode/commuting (e.g. walking or cycling or the use of an electric car to work, or travelling long distances by train instead of by plane), energy reduction, waste reduction (e.g. bringing one's own lunch, using re-usable coffee mugs and water bottles), and working from home; while they mentioned lifestyle habits such as working, sleeping, childcare and hobbies, consumption

patterns, travelling, and exercising/going to the gym/swimming as being associated with the term lifestyle habits. Hence, the focus groups confirmed the appropriateness of these terms for this focus group's data collection and future ones.

All focus group participants engaged in one or more of the aforementioned pro-environmental behaviours at work, but not always to the extent they wished. Aside from the themes of Motivations, Capabilities and Opportunities for engaging in pro-environmental behaviours at work identified based on the COM-B model, the absence of certain Capabilities and Opportunities, thus forming barriers to engaging in such behaviours, were also discussed. For each of these categories (Motivations, Capabilities and Opportunities), several sub-themes were identified as presented below based on thematic analysis.

4.2.1. Capability

Participants noted that knowledge about what items are recyclable or not helps them engage in recycling or choosing re-usable alternatives. However, specific knowledge and information is lacking. Similarly, communications from the organisation about energy costs and savings could help employees understand which behaviours and measures are especially effective and what the benefits would be. Example quotes are presented in Table 2.

Table 2. Capability sub-themes and sample quotes

Capability sub-themes	Example quote
Awareness/knowledge about recycling: disposable cups	"I think the last couple of months, there has been a lot of publicity with the fact that the cups are not recyclable, which I didn't realise and I think a lot of people don't realise, […] this is my recent environmental behaviour […], because I'm quite a big tea drinker so I have my [reusable] cup that I use now and try to carry with me."
Awareness/knowledge about recycling: recycling bins	"There is no education for people as to how to use [the recycling bins] so I look in a recycling bin and someone has thrown an old sandwich in there."
Awareness/knowledge on energy costs for the organisation	"If each year the electricity went down by £400,000, that meant you could pay for an extra mental health counsellor, and you could increase your journal subscriptions for specialist postgraduate courses, so why wouldn't you do it? We don't communicate the impact of those energy reductions in terms of what it allows us, as an institution, to do."

4.2.2. Opportunity

Participants often referred to convenience being an important factor for engaging in pro-environmental behaviour, e.g., a recycling bin being next to their desk or the campus café selling reusable coffee cups. A lot of frustration was vented regarding inefficiency at the institutional level and lack of systems and structures to encourage pro-environmental behaviour. Examples of issues participants felt should be improved on an institutional level were: building planning, specifically heating and ventilation; reducing the use of single-use plastic and paper; and having clearer information available and better procedures around recycling (see also Capability above). Participants suggested the

university could install solar-powered charging stations for mobile phones for students as well as free water-fountains around campus, have charging points available for electric cars, and have a bin for bringing in small electrical items for recycling. Example quotes are presented in Table 3.

Table 3. Opportunity sub-themes and sample quotes

Opportunity sub-themes	Example quote
Convenience	"Recycling regularly as a habit on a day to day basis… the bin's right by my desk so it's not hard. […] It certainly helps because when I was in my previous office, it was way over the other side of the room and I had to collect things in a sort of folder box on my desk and take them over once in a while, I still did it, but certainly for a lot of people, it would be demotivating when there is another [non-recycling] bin nearby."
Availability of recycling points	"We do have battery recycling points here […] but small electrical recycling, it's still quite difficult for most of us to dispose of a broken plug […]. So, the previous place I worked just had small bins in most office buildings and people were encouraged to bring their small electrical items to work and work would recycle them, because it's very difficult for me to go to a dump with a broken kettle but I can bring it to work and work can recycle it"
Opportunity for environmentally-friendly commuting	"We have really poorly managed cycling parking spots as well. There's no secure bicycle shed for example"
Building ventilation/cooling/heating	"The heating is centrally controlled so you can't adjust the temperature"
Lunches are served with single-use plastic plates & cutlery or in meal-deals	"When I go to the minimarket here, the meal deal is quite appealing but it involves a lot of wastage"
Use of stairs instead of the lift is not encouraged	"Take as an example, the graduate centre, where people have to use the lifts because the stairs are really hidden behind several closed doors. That's a really bad design and discourages people from using the stairs"
Personal time trade-off	"As always there is this trade-off. If I have to do more, this might also mean I lose time which I don't have because of say parental duties"

4.2.3. Motivation

Participants praised the mental benefits: feeling good about doing something good and feeling empowered. Specifically, for environmentally friendly commuting, financial and health benefits were pointed out. When looking specifically at the health and wellbeing (and thus spillover) benefits of pro-environmental behaviour, participants said they felt more energetic and less stressed if they walked or cycled to work, and that taking the stairs helped them stay active and aware. Several participants mentioned that engaging in pro-environmental behaviour at work also sets a precedent to get into pro-environmental habits outside work. For the organization, apart from financial benefits, people mentioned that sustainability is simply good public relations and creates a better working environment. Example quotes are presented in Table 4.

Table 4. Motivation sub-themes and sample quotes

Motivation sub-themes	Example quote
Feeling positive and empowered	"We feel we are doing a bit, even though most of the waste is business-related and there is nothing we can do about it directly. So, it's the feeling that you are doing something instead of doing nothing"
Getting into the right habits, also outside work	"You can get into the habit of taking a bottle with you to work, you will take it with you when you go out doing shopping, or for a walk in the park, you get used to having to take a bottle with you"
Creating a positive working environment	"I think it helps to have a more positive working environment and it contributes to that because it shows that the university cares for the environment and for everybody"
Setting an example	"I think it is the responsibility of academics to set an example also for their students as well …I am based in a room with other PhD students, so I think I somehow need to set some kind of example in this type of behaviour. So yes, I think it's beyond an individual responsibility, let's say, ambassadors to some extent to this institution, to lead"
Good PR for the organization	"You know when you have students looking round the

	campus deciding where to go, younger generations care more than older generations and if they see that these behaviours are in place and these systems are there, it looks good, it gives a good impression of the organisation"
Health-related motivations	"I always used the stairs, and it was part of my daily sort of, 'this is how I keep myself active […]"

4.2.4. Focus groups: Additional insights, summary and next steps

For motivating employees to engage more in pro-environmental behaviour, participants were clear that patronizing messages and stating the obvious (e.g. "you should use the recycling bin") is ineffective. They indicated that changes can be made instead by peer pressure and changing the norm: changing behaviour may encourage colleagues also to change theirs.

"I think signs only have a limited value and I think when people see people that have actually changed their behaviours, and that this is doable and won't be disruptive, often they might consciously think, "oh I can do that, why don't I do that?"

"Exposing your colleagues to many examples without explicitly stating that, without sounding preachy or superior basically"

An information campaign could provide factual information about actual benefits, with numbers and figures, as suggested here:

"I think the university needs to share more both what it spends per year on energy and what it saves per year on energy […]. It's finite money, but somehow, we don't communicate the impact of those energy reductions in terms of what it allows us, as an institution to do. How many more academic posts is that? Or how many more opening hours in the library is that? Is it three more careers consultants?"

The key messages taken from the focus groups (based on RQ1 to RQ3), which informed the development stage of the intervention campaign, were:

1. Pro-environmental behaviour needs to be made easy and convenient
2. People want to have trust in the organisation taking sustainability seriously and for the organisation to set an example
3. Patronizing messages about behaviour are off-putting. Instead, communication should focus on a) factual information, b) a sense of community, and c) feeling positive/empowered
4. Peer pressure works: changing the norm will change people's habits

The next level of the BCW consists of nine behaviour change intervention functions, each addressing a subset of the sources of behaviour. For example, developing knowledge and understanding emotions about the behavioural target through 'Education' improves reflective motivation, whereas 'Environmental Restructuring' creates both physical and social opportunity. In a recent systematic review of behaviour change interventions for saving energy in office-type workplaces, 'Environmental Restructuring', often overlapping with 'Education' and 'Persuasion', was amongst the intervention functions with the largest potential for success (Staddon et al., 2016). These intervention functions, along with recommendations from the focus groups, were used for the development of our pilot intervention study.

4.3. Co-development Workshop of the Intervention: Methods

A co-development workshop was held where academics and practitioners working on environmental or health behaviour change joined the research team to develop and co-create the informational campaign employed in this project. The activity was supported by Carbon Credentials (CC), a consultancy company that works with organisations to help reduce their carbon impact. They also led the brief design outline and assisted the research team during the co-development workshop to ensure the goals were fully achieved based on their experience in the industry. The workshop participants (a total of seven plus the research and the CC teams) were selected due to their expertise. They were debriefed about the focus of the intervention and the study's parameters (i.e., aiming to motivate pro-environmental behaviour in the workplace, which has the potential to spill over to physical activity and our stealth marketing approach) before being asked to brainstorm ideas for the intervention in line with the aims of this study.

During the workshop, five different design briefs were created by workshop participants working in teams. The design briefs allowed the teams to take notes on the main components of their ideas, which were: Fundamentals: What will we be producing and who will see it?; Objective: What is

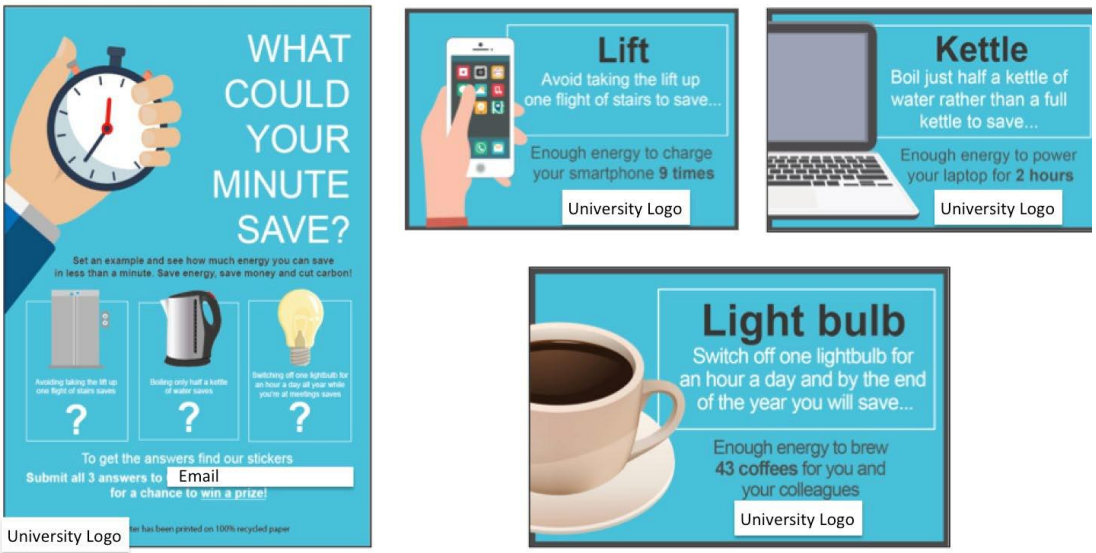
the outcome we are looking for?; Target Audience: Who are we trying to reach?; Know: What information do they need to know? i.e., what needs to be included in the design?; Feel: how do you want people to feel?; Do: What actions do you wish people to take?; Taglines: What messages do we want to use?; and References: Research inspiration, styles and examples of previous work.

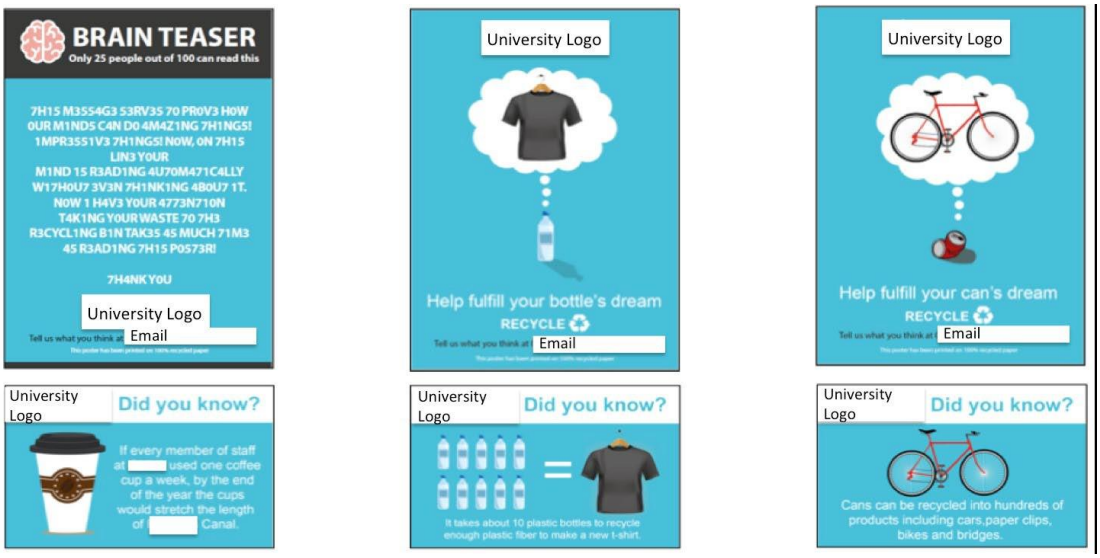
4.4. Co-development Workshop of the Intervention: Results

Taking into account also the recommendations from the focus groups (i.e., results of R1 to RQ3) conducted prior to the co-development workshop, two ideas were chosen for implementation. The two design briefs were developed into a poster and sticker campaign with the help of CC. Both design briefs focused on pro-environmental behaviour changes at work at the individual level and none had any reference to physical activity, in line with our stealth marketing approach.

The first design focused on energy saving. The poster and accompanying stickers highlighted the impact that employee actions can have on energy saving, for example "Avoid taking the lift up one flight of stairs to save enough energy to charge your smartphone 9 times". Providing new information contributes to Psychological Capability (having the necessary knowledge) as well as Reflective Motivation (increasing knowledge to elicit positive feelings about a behavioural target). The design aimed at empowering employees to make a difference and take action (Motivation), and also included a game element with a chance to win a green prize. The second design focused on recycling, aiming to entice staff to use the recycling bins. The posters used humorous messaging and the stickers on the bin corresponded to the poster. The concept was based on a sense of pride in setting an example, being part of the university community, contributing to a positive working environment, feeling positive and empowered, and having a sense of ownership and making a contribution to the bigger picture (Motivation). Both designs contained factual information that employees could relate to (Capability). Also, by including an email address on the posters, people were invited to be involved and give feedback. The posters and stickers used a blue colour theme to infer "healthiness and well-being" (according to what workshop participants said) while distinguishing the materials from other environmental endeavours often using green. Importantly, the posters were printed on 100% recycled paper, which was explicitly mentioned at the bottom of each poster. The BCW intervention functions employed through the use of posters and stickers were 'Education' (increasing knowledge or understanding), 'Persuasion' (using communication to induce positive or negative feelings or stimulate action) and 'Environmental Restructuring' (changing the physical or social context). Examples of the materials produced can be seen in Figure 2.

Figure 2. Intervention Materials





The informational campaign materials were combined with a green champion, a volunteer employee who encourages and motivates colleagues to make pro-environmental behaviour changes (predominantly recycling and energy reduction), acts as a role model and exhibits pro-environmental behaviours, gets involved and takes an interest in environmental issues, and shares information and messages that will encourage pro-environmental behaviours. The green champion was recruited from the initial focus group participants and was trained by CC on two occasions (e.g., at the start of and half-way through the intervention period). The inclusion of a green champion in the intervention corresponds with the BCW intervention function of 'Modelling' (providing an example for people to aspire to or imitate, thus contributing to Motivation).

5. STAGE 2: PILOT STUDY

5.1. Pilot study: Methods

A feasibility and pilot study was conducted over an 8-week period to collect data, which allowed us to examine H1 to H3. Employees from two different schools took part in the study (two out of the three schools that participated in the stage 1 focus groups), with one school serving as the control group and one as the intervention group. The pilot had 12 participants in total (according to HR data, in both schools combined, 296 people were on an academic or administrator contract or registered as a PhD student at the time of recruitment, and thus eligible to take part). In the intervention group, posters (A3- and A4-sized) were placed in corridors, the kitchen and the reception area of the school, and also displayed on two large digital screens. Employees in this school also received emails from or talked to the green champion about the pro-environmental behaviours they could engage in at work in line with the intervention (i.e., energy saving and recycling). The green champion distributed the stickers provided, focusing on a different design each week, in addition to demonstrating and discussing workplace pro-environmental behaviour with colleagues.

Both schools were based on the third and fourth floors of their respective buildings and were accessed by one lift and several staircases. The number and placement of recycling bins was comparable between the two schools, as was the energy consumption of their respective buildings. Participants were recruited based on purposive and convenience sampling; in both schools, employees were invited by email to take part in a study on "Workplace pro-environmental behaviours and lifestyle habits", similar to the focus groups and with no explicit reference to health or physical activity. Participants in both groups were asked to complete a survey to investigate their pro-environmental behaviours at work before and after the intervention (i.e., informational campaign and green champion) to examine H1. The questionnaire items can be found in Table 5. Items were rated on a 5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree) and were based on adapted scales from prior workplace pro-environmental behaviour literature (Manika et al., 2015). Even though these measures are self-reported, they were considered appropriate as per prior research investigating their spillovers (Manika et al., 2015).

In addition to the survey measuring pro-environmental behaviour at work, employee observations were conducted before and after the intervention to assess the spillover effects of the self-reported

employee pro-environmental behaviour on physical activity and sedentary time. Specifically, the observations focused on walking time, standing time, number of stairs climbed and sedentary time (H2 and H3). Pilot participants were informed that the observers would monitor "workplace pro-environmental behaviours and lifestyle habits" consistent with the pre-pilot focus groups. Past research suggests that pedometers increase physical activity (Bassett and Strath, 2002; Sylvia et al, 2014) and hence they could not be relied upon to measure physical activity in this particular study. Moreover, giving participants a pedometer would make explicit that their walking and standing time were of interest, defeating the purpose of a stealth approach. Instead, observations were performed to measure physical activity, using manual timings (as per Webb et al., 2011).

The first round of observations took place in the week before the start of the intervention, with the second observation during the final week (intervention duration 8 weeks). Observations lasted 3 hours and 45 minutes for each participant on each of the two occasions. Four hours is half a working day and hence was considered a good indicator of physical activity and sedentary time in the workplace. 15 minutes of the four hours were used to explain what the observer was going to do prior to the observation and at the end to instruct participants to complete the self-reported questionnaire on pro-environmental behaviour. At the end of both observation periods, participants each filled out the online survey on pro-environmental behaviour. Pilot participants consented to the pilot prior to the data collection and were informed that observers would monitor their behaviour only when leaving their office. All participants had offices and hence it was assumed that while they were in their offices they were sedentary. Walking and standing time were measured manually with a timer phone app [i.e., "MultiTimer" (PersApps, Singapore)] by the observers, only when participants left their offices. Sedentary time was calculated by subtracting the walking and standing times from 3 hours and 45 minutes of observations. Observers also recorded the number of stairs the participants climbed manually. Table 6 includes the descriptive statistics for before and after the intervention for both groups/schools.

The intervention and control group consisted of 6 participants each. In the control group there were 3 academics, 2 postgraduate research students and 1 professional services member; while in the intervention group there were 5 academics and 1 postgraduate research student. The green champion in the intervention school was a member of professional services. None of the participants reported environmental responsibility as part of their job role. All participants received a £40 Amazon voucher for taking part. At the end of the second observation, participants received a debriefing describing the full study purpose, including the potential spillover effects of pro-environmental behaviour on physical activity. All observations and measurements on pro-environmental behaviours as well as physical activity indicators (walking and standing time; numbers of stairs taken) were disclosed in the debrief and participants were given the chance to delete their data from the study.

To analyse the results we computed (for both pro-environmental behaviour and physical activity related behaviour metrics), the difference before and after the intervention i.e., $\Delta_{(after - before)}$. A positive score notes an increase after the intervention and a negative score a decrease. We then used these scores to examine whether these differ between the intervention and the control groups.

5.2. Pilot study: Results

Survey results for participants' self-reported pro-environmental behaviour are presented in Table 5, for before and after the intervention with the control and intervention groups; physical activity data was collected via observations and is presented in Table 6, for before and after the intervention with the control and intervention groups.

Table 5. Questionnaire Items of Self-reported Pro-environmental Behaviour in the Workplace and Descriptive Statistics for Before and After the Intervention for the Two Groups/Schools.

			Control Group			Intervention Group		
Variable (Cronbach's Alpha)	**Items**	**Before/After Intervention**	N	M	SD	N	M	SD
Recycling (a=.95)	At work, I put the following in separate recycling/compost bins: - Paper - Cardboard - Cans - Plastic cups / bottles - Glass	Before	5	4.76	.35	3	3.33	2.08
		After	5	4.68	.17	4	4.85	.30
Energy Saving (a=.65)	- At work, I add clothing rather than using a personal heater when it is	Before	5	3.00	1.05	3	4.33	.33

	cold. - At work, I use the stairs rather than the lift to move between floors. - At work, I boil the exact amount of water I need for my coffee/tea.	After	4	3.41	.68	3	4.33	.57

Table 6. Physical Activity Related Descriptive Statistics Before and After for the Two Groups/Schools

Control Group				
Observation Variables		N	M	SD
Total Number Of Stairs	Before	6	82.66	130.92
	After	6	40.33	45.73
Walking Time (Seconds)	Before	6	468.17	293.33
	After	6	450.17	223.01
Standing Time (Seconds)	Before	6	279.00	148.09
	After	6	376.00	160.76
Sedentary Time (Seconds)	Before	6	12752.83	353.44
	After	6	12673.83	328.55
Intervention Group				
Observation Variables		N	M	SD
Total Number of Stairs	Before	6	30.33	30.81
	After	6	86.16	128.56
Walking Time (Seconds)	Before	6	187.50	118.26
	After	6	387.50	499.90
Standing Time (Seconds)	Before	6	161.50	257.17
	After	6	394.67	579.05
Sedentary Time (Seconds)	Before	6	13151.00	350.48
	After	6	12717.83	738.65

Overall results examining H1 to H3 are presented in Table 7. In regard to H1, recycling behaviour (H1a) and energy saving behaviour (H1b) increased after the intervention in the intervention group, but stayed the same in the control group. In regard to H2, walking time (H2a) increased in the intervention group after the intervention (but it decreased in the control group), standing time (H2b) increased in the intervention group after the intervention (and it increased to a lesser extent in the control group), and the use of stairs (H2c) increased in the intervention group after the intervention (but decreased in the control group). In regard to H3, sedentary time decreased in the intervention group after the intervention (and it decreased in the control group to a lesser extent). These results suggest that the intervention could potentially result in positive changes in regards to both pro-environmental behaviours and physical activity in the workplace, although given the small sample size we could not test for significance. Hence, the hypotheses cannot be fully supported at this time, although we can partially support H1 for both the intervention and control groups, and H2 to H3 for the intervention group only, based on the mean differences found.

Table 7. Pilot Results Examining H1 to H3

Variable		**N**	**M**	**SD**
Energy Saving Composite Difference	Control	4	0.00	0.0
	Intervention	2	.16	-.30
Recycling Composite Difference	Control	4	.00	-.42
	Intervention	3	1.46	-1.35
Walking Time Difference	Control	6	-18.00	-1.69
	Intervention	6	200.00	-.94
Standing Time Difference	Control	6	97.00	-.94
	Intervention	6	233.16	-.45
Sedentary Time Difference	Control	6	-79.00	.21
	Intervention	6	-433.16	.90
Total Number of Stairs Difference	Control	6	-42.33	.28
	Intervention	6	55.83	-1.69

Note: A positive score notes an increase after the intervention and a negative score a decrease.

6. STAGE 3: REVEAL STAGE AND ACCEPTABILITY ASSESSMENT

For the reveal stage, a 10-minute video was created with the assistance of CC, in which the purpose and design of the research study were explained. All participants from the first set of focus groups (except the green champion) as well as from the pilot study were sent the video and were invited for the follow-up focus groups in order to complete our acceptability assessment. In total, six people agreed to participate in the final focus groups: one from the stage1 focus group; one from the stage 2 intervention group, and four from the stage 2 control group. The aim of the focus group was to develop an understanding of the cognitive and affective responses to the video and study, to get feedback on what participants thought worked and did not work with regard to the intervention, and to get participants' thoughts on future studies and a larger-scale implementation of the intervention using a stealth marketing approach. The focus group discussions were kept relatively unstructured, in order to give participants the opportunity to share their thoughts on anything they considered relevant. Participants were asked what they thought and felt after watching the video. All participants gave written informed consent to take part in the post-pilot focus groups and for the discussion to be recorded. Thematic coding was used to analyse the results in line with the initial focus groups of stage 1.

Participants liked the video and said that it explained the objectives and methods of the study well. People thought the connection between pro-environmental behaviour and physical activity in the workplace was interesting and hadn't thought about this connection themselves. Pilot study participants mentioned that the observations had an effect on their behaviour during the observation. The two main effects they reported were a) being more aware/conscious of their pro- and non-environmental behaviours and habits, and b) feeling the need to work extra hard and be focused because they were being observed, and as a result may have sat down more than usual.

As in the stage 1 focus groups, it was emphasized that although people are willing to engage in pro-environmental behaviour, they really rely on the organisation to make this possible, e.g. the buildings need to be designed well, schools should discourage the use of single-use paper cups, and staff need to be well-informed about recycling policies.

"In the building where I am based, […] in order to access the stairs, one has to open three or four fire glass doors, so the stairs are really hidden. And basically, this is like a fault of building design, so I think it would be a source of frustration for some people, having a building that's not fit for purpose but at the same time asking employees to use the stairs".

The posters, stickers, and green champion were all judged very positively, and thought to be effective. People liked the colours and the facts on the posters/stickers, and the fact that the stickers can be easily placed in the relevant context (e.g. on or next to the light switch). It was suggested that it would be a good idea to have a green champion on various departmental levels, as only one green champion might not reach everyone in the department. It was pointed out that academia can be a challenging environment for this kind of study or intervention campaign. In addition to the notion that a single green champion might not be sufficient, it was noted that a) there is a great deal of variety in context, people's interests, and practical barriers between Schools (e.g., in Computer Science, PCs often have to be left on overnight for the running of analyses, and in some departments, people will have more interest in environmental matters already); and b) academics' and postgraduate students' working days can vary a lot, with days of just writing, and days of meetings and lecturing, which makes comparing between two observations challenging.

"I feel like within academia, there's quite a big difference as to how much activity I could do from day to day. So when I was being observed, both times, I was like I'm going to sit at my desk, but there are some days when I go to have a meeting with my supervisor, I go to a seminar, I go for lunch or something, I'm walking around quite a lot. If I'm in a meeting with my supervisor I'm on my feet because we're talking at a board and it's active, there's a big difference between day to day."

Overall, the post-pilot interviews confirmed the acceptability of the stealth marketing approach and the potential for large-scale implementation.

7. DISCUSSION

This project examined the feasibility of using a Bait-and-Tease stealth marketing intervention to increase office-based employees' physical activity and reduce sedentary time in the workplace. The aim was to assess the potential of the stealth intervention for large-scale study implementation.

The average U.K. office worker spends approximately 5.3 hours per day sitting, while at work (Smith et al, 2016). This is a significant amount of time, with potentially devastating health consequences, considering the link between seating time and physical and mental health conditions, such as metabolic syndrome, heart disease and depression, even when controlling for physical activity

levels (Gardner et al., 2017; Chau et al., 2013; de Rezende et al., 2014). Although many workplace interventions have been developed and implemented in recent years, results are mixed (Gardner et al., 2016), with most very or quite promising interventions tending to target sedentary behaviour instead of physical activity (Gardner et al., 2016). Stealth marketing techniques are considered to be capable of changing behaviour towards a healthier lifestyle (Cibrian et al., 2016), and have been used to promote physical activity among school children, with promising results (Cibrian et al., 2016; Flores, 1995). However, they have not been previously applied in an office environment. This can be considered as an omission, particularly as a carefully-designed intervention may be able to support overcoming the known perceived barriers to breaking up sitting time among office workers (such as "tied to desk" and "organizational support and interpersonal influences"; Ojo et al., 2016).

Our study aimed to respond to this knowledge gap, by developing and testing the feasibility of an intervention using a stealth marketing approach to increase physical activity and reduce sedentary time in the workplace. The intervention was designed around aspects of the COM-B model (Michie et al., 2011). A recent study by van Kasteren et al [46] identified a number of COM-B mechanisms that contribute to office based physical activity. Many of the socio-cultural (e.g. work-related social interactions) and physical (e.g. building design and layout) mechanisms for change, overlap with the concepts discussed in our focus groups in regard to environmental behaviours, potentially indicating the mechanism by which the spillover effect is able to occur.

Even though this is not the first study to examine the potential spillovers of employee pro-environmental behaviour on well-being factors (e.g., employee job satisfaction, the hospital experience of patients) of key stakeholders (see Manika et al., 2015), it is the first to reveal the potential spillovers on physical activity and sedentary behaviour in the workplace, and to examine the feasibility of stealth marketing approaches for workplace physical activity interventions.

Both the observations and the focus group outcomes suggest that the concept is feasible and has potential for large-scale implementation. In the final focus groups, while participants had some reservations or suggestions regarding certain aspects of the intervention, they were interested in the idea and responded positively to the concept of the "Bait-and-Tease" stealth technique. Both in the post-pilot survey and in the final focus groups, participants were very positive about the poster and sticker campaign as well as the green champion, and were excited about a larger-scale implementation, as long as contextual factors (e.g. the practical barriers of a particular building) are borne in mind.

The participants' positive reaction to our revelation is not surprising: office workers are aware that high amounts of sitting time have adverse consequences (Ojo et al., 2019). However, they lack knowledge regarding recommendations and are at times unmotivated to change (Ojo et al., 2019), particularly as for many productivity was conflated with being at the desk (Hall et al., 2019), while standing in other office-based activities (e.g., meetings) was being misperceived as challenging the authority of other attendees (Mansfield et al., 2018). Therefore, it appears that in order to encourage breaking up the office-based, sedentary status, it is important for office-based organisations to either introduce a different concept (e.g., mixed seating/standing office space) or relate this to a wider, organisationally accepted strategy, such as the promotion of environmental sustainability.

While in this study the intervention functions 'Education', Persuasion' and 'Environmental Restructuring' were employed, there was no 'Enablement' (increasing means/reducing barriers to increase capability or opportunity). 'Enablement' was found to be another important contributor to success in workplace behaviour change interventions (Staddon et al., 2016). For example, participants in the pre-pilot focus groups and the pilot study complained about a lack of control over heating and cooling in their offices, or about stairs being difficult to access. When the behaviour which is encouraged by an intervention campaign is at same time being discouraged by other factors (e.g., building design, lack of organisational support), people might disengage from the campaign. In some cases, encouraging pro-environmental behaviour and physical activity may be conflicting in the workplace. From an environmental viewpoint, document printing should be discouraged, while having to stand up and collect one's items from the printer actually increases walking and standing time. Similarly, placing recycling bins closer to people's desks may encourage them to use them more, but this would cancel out any potential health benefits.

Perhaps not surprisingly, studies have shown that people with more pro-environmental values and attitudes engage more in pro-environmental behaviour (Meinhold and Malkis et al., 2005). However, when looking at actual impact, motivational factors explain very little, while socio-economic status is in fact the best predictor or pro-environmental behaviour. People with high pro-environmental self-identity typically engage in actions with small environmental benefits, but this is counterbalanced by a strong correlation between income and high-impact energy consumption behaviour (Moser and Kleinhückelkotten, 2018).

Similarly, campaigns such as the one used in the current study may especially appeal to people willing to engage in low-impact behaviour changes such as recycling. To generate a larger impact, both for environmental as well as health outcomes, a future campaign should potentially focus more strongly on behaviours such as commuting. However, to change behaviours on a larger scale like that, a different approach may be required. Our work suggests that stealth marketing may form part of the solution and, thus, further work based on our findings should be pursued.

8. LIMITATIONS AND FUTURE RESEARCH

This was a small feasibility study. As such we can only treat the results as indicative (we cannot verify statistically significant differences of before-after intervention results), paving the way for a larger study, which will study the effectiveness and cost-effectiveness of the intervention. Related to this is the issue of self-selection: people who agreed to take part in the study were likely to be more interested in pro-environmental issues and more inclined towards pro-environmental behaviour already. In a larger, future study, aiming to explore the effectiveness of the intervention, confounding variables such as these should be considered and controlled for, and the intervention should be tested within other workplace settings outside Higher Education.

For the study to be both ethical and feasible, participants had conscious knowledge of being observed. This is likely to reduce the ecological validity of the findings. The fact that each participant was only observed for two 4-hour observation periods adds an additional limitation to this work. Various participants also spent much of the observation time in meetings, or chose to be observed on a day when they were mostly at their desk, which may not be representative of their usual behaviour. Future research could mitigate some of these issues by instead enrolling multiple entire open plan offices into a study. A data collector could then measure the behaviour of multiple individuals. Participants would feel less individually scrutinised and extremes in individual differences would be smoothed out.

Finally, future research is needed to explore having green champions for different work groups, e.g., an academic for academics and a professional services member for professional services. This was not the case in this pilot study and it is likely that pilot participants may not have received sufficient exposure to the green champion's communications. As was noted by the post-pilot focus groups, a green champion may be needed on various departmental levels in order to reach everyone.

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